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Remarks

Claims 1-11, 13-16, and 18-24 were pending in the application. Claims 1-11, 13-16, and 18-24 were rejected. No claims were merely objected to and no claims were allowed. By the foregoing amendment, claim 9 is canceled, claims 1-8, 10, 11, 13-16, and 18-24 are amended, and claims 25 and 26 are added. No new matter is presented.

Interview Summary

Applicants thank the examiner for the courtesy of a telephone interview on April 17, 2006 between the undersigned and Examiner Shakeri.

The interpretation of Reitmeyer in the January 20, 2006 Office action was discussed. The examiner proposed the foregoing amendment to claims 1 and 10 regarding the circumferential gap as mooted the prior interpretation of Reitmeyer. The undersigned submitted that the claim 20 wording would also distinguish but no agreement was reached thereon.

The undersigned submitted that the DE'396 reference lacks suggestion for use with an elongate quill/bit and proposed amending the claims to recite that combination. No further agreement was reached.

The undersigned distinguished the tip word outlet flow direction of various claims with the reverse of Arai et al. The examiner suggested that the undersigned introduce further, but unspecified, structural limitations in this regard. No further agreement was reached.

Claim Objections

Claim 9 was objected to under 37 C.F.R. 1.75(c). Although traversed, the rejection is believed moot in view of the foregoing amendment.

Claim Rejections-35 U.S.C. 112

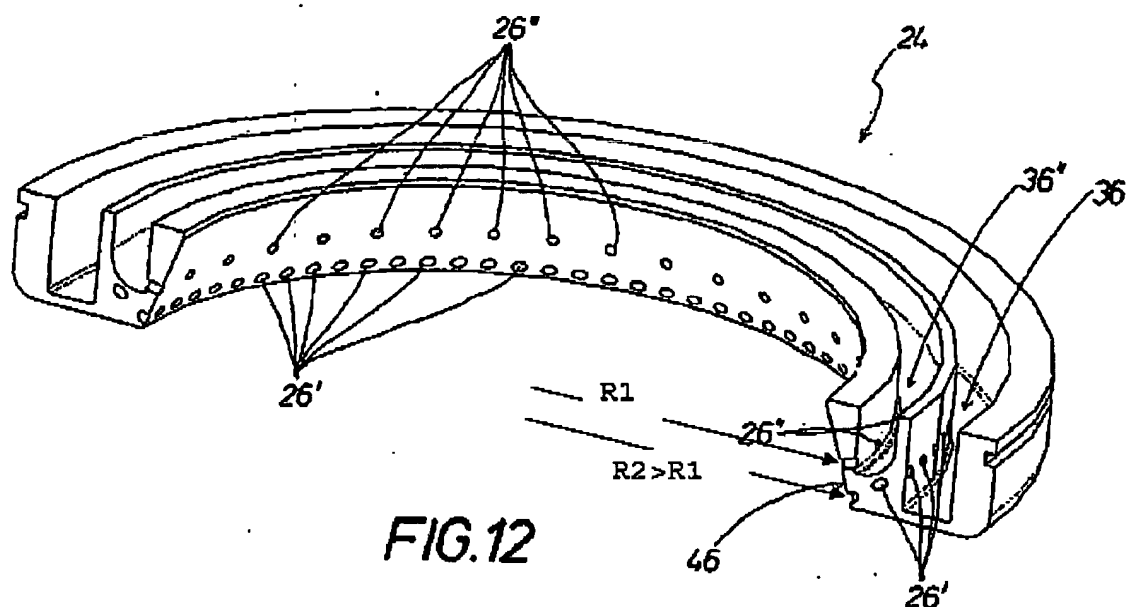
Claims 16-19 were rejected under 35 U.S.C. 112(2). Applicants respectfully traverse the rejection. It was queried "how the embodiment for one coolant outlet discharges a plurality of streams?" Due to surface tension of the coolant, it may be possible for a single outlet to simultaneously emit multiple streams (e.g., if the outlet has a complex shape). No broadening is involved in this.

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Claim Rejections-35 U.S.C. 102

Claims 10, 11, and 13-15 were rejected under 35 U.S.C. 102(e) as being anticipated by DE 202 16 396. Applicants respectfully traverse the rejection.

The two apparent groups of outlets 26' and 26" are at different radial positions as shown below. This precludes both groups being applied to the claim and the "no other" element of claim 10 precludes the possibility that only one of these two groups is applied while the other is ignored. Accordingly, DE '396 cannot anticipate claim 10. Further, claim 10 has been amended to identify the presence of an elongate abrasive bit. There is no suggestion for DE'396 having such use.



Claims 10, 11, 14-16, 20 and 21 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,471,573 of Reitmeyer. Applicants respectfully traverse the rejection.

Independent claim 10 identified a "circumferential spacing between adjacent ones of the outlets [as] being no more than 72°..." Independent claim 20 identified a "circumferential spacing between each of the outlets and an associated two adjacent ones of the outlets of no more than

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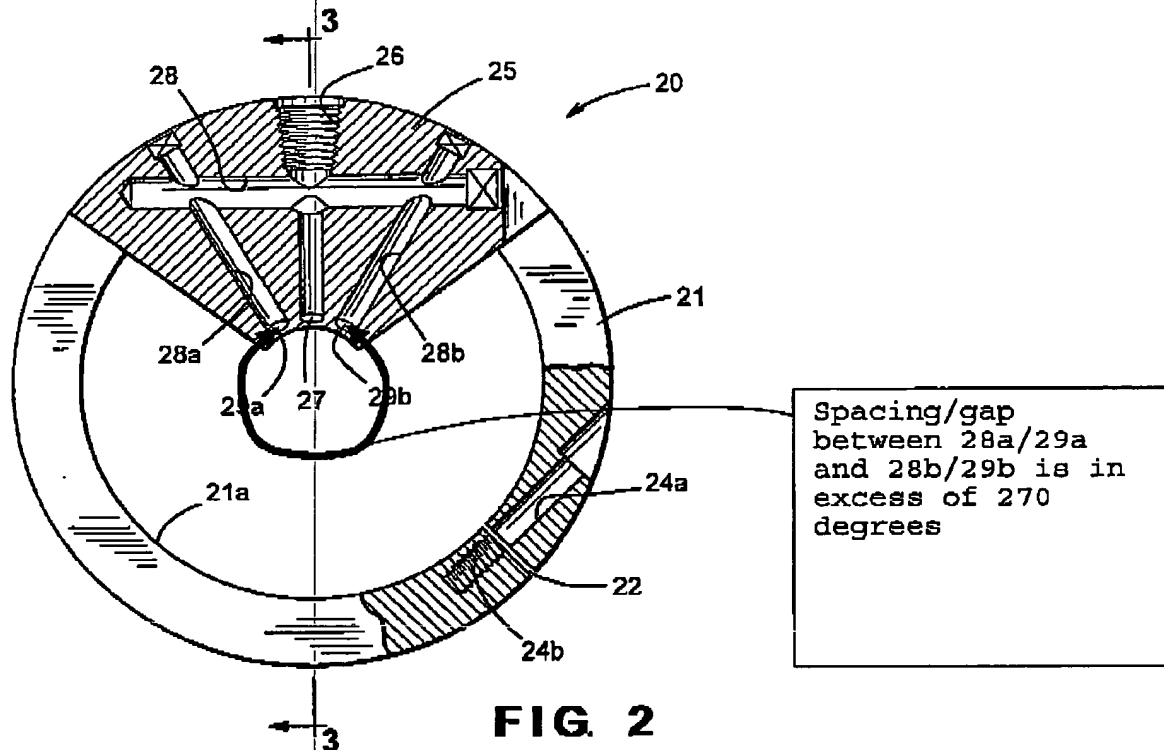
72°..." The Office action identified Reitmeyer elements 27, 29a, and 29b as the outlets. Clearly, the circumferential spacing between the single central outlet 27 and each of its two adjacent outlets 29a and 29b is within the claimed 72°. However, this is not the case for the outlets 29a and 29b. Although each is within 72° of one of its adjacent outlets, there is a gap in excess of 270° between it and the other outlet (see below). As applied to claim 10, the issue is believed moot in view of the amendment as proposed by the examiner.

Even with a very broad claim interpretation, claim 20 already specifically identifies the plural "each of the outlets" as having the claimed relationship to "an associated two adjacent ones..." The plural is not anticipated by the singular. The examiner's interpretation only applies to the center outlet, leaving the other two outlets as lacking "an associated two adjacent ones..." Thus, claim 20 is not anticipated.

Furthermore, there is no indication of the redundant circumferential coverage of claim 15 (which Applicants note depends from claim 1 which has not been similarly rejected). The page 8 assertion that there is redundant coverage "since the bit is rotating..." is improper vitiation of the claim element.

Claims 21 and 22 further define the bit as a quill and identify properties thereof. The prior art fails to suggest the nozzle in combination with such a quill. Reitmeyer, further, does not disclose the material of claims 14 and 15 or the total redundant circumferential coverage of claims 15 and 16 (as amended) because clearly there is a large sector not addressed by any of the Reitmeyer sprays.

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Claims Rejections-35 U.S.C. 103

Claims 1-11, 13-16, and 18-24 were rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent 5,332,341 of Arai et al. in view of U.S. Patent 4,252,768 of Perkins et al. Applicants respectfully traverse the rejection.

Arai et al. discloses a pressure foot for a printed circuit board drilling apparatus discussed in the prior amendment. Perkins et al. discloses a very specific construction of a sandblasting nozzle. The Perkins et al. nozzle has a core and a separate casing. The core material is a ceramic composite having a composition selected for properties including high temperature oxidation resistance, high strength, high abrasion resistance, high resistance to thermal shock, and the like. Col. 3, lines 26-63. The Perkins et al. delivery of a high temperature sandblasting medium is substantially different from both the pressure foot of Arai et al. on the one hand and the present coolant nozzle on the other hand. There has been no properly cited motivation as to why one of ordinary skill in the art would so modify the Arai et al. pressure foot, let alone attempt its use as a coolant nozzle. The page 8, second paragraph, recitation of asserted properties taught by Perkins et al. ("light, durable, strong,") is insufficient motivation absent persuasive showings that Arai et

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al. lacks these properties and one of ordinary skill in the art would have found the need to cure such deficiency.

Claim 2 further identifies the body as being a single unitary piece. This, of course, does not preclude the presence of other components such as fittings, fasteners, and the like. Perkins et al. fails to disclose this, let alone suggest this as part of a combination with Arai et al. Perkins et al. clearly teaches away, using ceramic only as a core/insert within a case or body. There has further been no demonstration of how such a core would be placed in the Arai et al. nozzle or manufactured in the more complex configuration of the Arai et al. nozzle.

Claim 5 identifies the outlets as positioned to direct coolant streams toward an axis of the bit. Arai et al. clearly teaches away from this. The direction appears tangential (and away from rather than toward the tip).

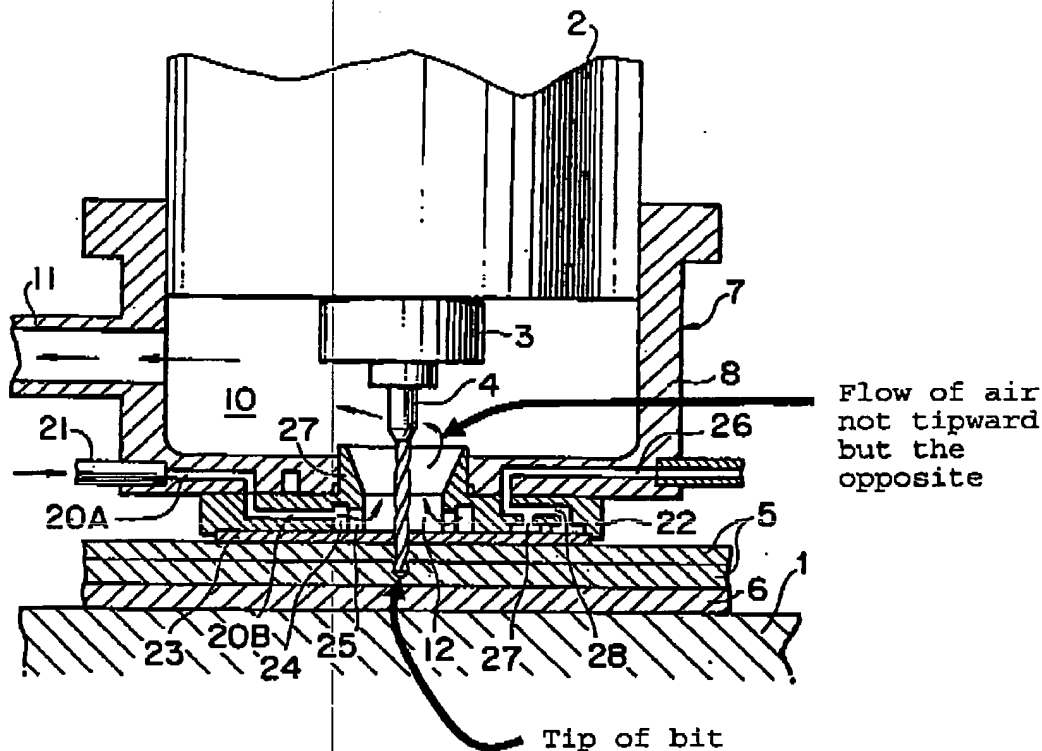
Claim 15 identifies the cooling outlet as providing redundant coverage around the circumference of the quill so that, during a machining operation, the effects of a workpiece blocking one or more sprays of the coolant are limited. The Arai et al. configuration does not provide for workpiece blockage because the outlets are positioned and oriented for a different purpose. The Office action stated that "changing shape, dependent on work-piece parameters, involves only routine skill in the art." Office action, page 5. However, there is no indication that Arai et al. is subject to any changes in work-piece parameters. The assertion that the combination "is capable of being used in combination with the quill" is merely conclusory and still does not constitute suggestion to so use.

Claim 24 identifies aqueous and oil-based coolants not suggested by the art of Arai et al. or any proper combination of references therewith.

New claim 26 further identifies stream centerlines meeting the bit at an acute angle. Support for this is found in elements 101 and θ_2 of FIG. 5 and the first paragraph of page 4. This is believed to further distinguish the flow direction of Arai et al.

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FIG. 1



Claims 13, 19, and 22 were rejected under 35 U.S.C. 103(a) as unpatentable over Reitmeyer. It was asserted that "Reitmeyer meets all of the limitations of above claims, except for the number of outlets, the size and the combination with a quill, all obvious modifications..." Office action, page 5. This is merely a hindsight reconstruction of the present invention. The attempted modification of Reitmeyer, if possible, would greatly increase Reitmeyer's already high complexity and manufacturing cost. This is evidenced by the number of parts and machining steps required just to provide the three outlets of Reitmeyer. This further confirms the non-obviousness of the present invention.

Claims 1-9, 18 [believed 14], 15, and 18 were rejected under 35 U.S.C. 103(a) as unpatentable over Reitmeyer in view of Perkins et al. Applicants respectfully traverse the rejection.

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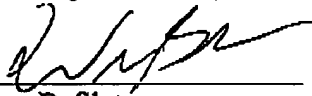
There is no suggestion for the proposed combination just as there is no suggestion for the Arai et al. and Perkins et al. combination.

Claims 1-9 and 16-22 were rejected under 35 U.S.C. 103(a) as being unpatentable over DE '396 in view of Perkins et al. Applicants respectfully traverse the rejection.

It was merely asserted that "DE '396 in view of Perkins et al. further modified in light of combination with known tools, depending on the intended use, as indicated above meets all the limitations." Office action, page 6. Again, this is thoroughly conclusory and without support. As with the other obviousness rejections, there is a substantial degree of bootstrapping in first unsupportably proposing a combination that yields a portion of the invention and then vaguely asserting optimization for what is a non-obvious use (in lieu of a proper suggestion for the remaining elements). Clearly, there is no indication of why one working with the nozzle of DE'396 would seek the Perkins et al. sandblasting nozzle for a solution to any problem. As noted above, there is no suggestion for the use with an elongate abrasive quill/bit. Additionally, new claim 25 identifies a plenum and trunk relationship not found in the proposed combination. The basic structure of DE'396 lacks such a relationship and it is not provided by Perkins et al. Support for this is found in elements 64 and 72 of FIGS. 2 and 3 and the last paragraph of page 3.

Accordingly, Applicants submit that claims 1-18, 10, 11, 13-16, 18-26 are in condition for allowance. Please charge any fees or deficiency or credit any overpayment to our Deposit Account of record.

Respectfully submitted,

By 
William B. Slate
Attorney for Applicants
Reg. No.: 37,238

Telephone: 203-777-6628

Telefax: 203-865-0297

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I hereby certify that this correspondence is being facsimile transmitted this 20th day of April, 2006 to the USPTO, at Fax No. 1-571-273-8300.


Antoinette Sullo